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Soil Conservation Problems In Florida

A Discourse On The Problems Of Conserving Soil Against The Ravages Of Soil Erosion And Other Weather Elements . . . By Florida Experiment Station Soil Chemist . . .

Soil conservation

R. M. Barnette

The attention focused on soil erosion and flood control during recent years has emphasized the general problem of soil conservation and the place which it has in a cooridnated program of effective and economical land and water use rather than abuse. That the people of the nation are becoming more and more "conservation conscious" is reflected in the activities of their law makers in passing acts establishing the Soil Conservation Service with its program supplementing flood control legislation, as well as encouraging sound agricultural practices for our lands. In addition, the soil conservation features of the Agricultural Adjustment Acts may be cited. However, the practical application of known sound soil conservation measures as well as the critical study of numerous factors involved in the development of a coordinated program of land use most suited for an economically productive agriculture, and soil and water conservation in the United States at the same time is a tremendous task requiring integration.

To assist in evaluating the problems of soil conservation, the land in the United States has been divided into so-called "Provisional Soil Conservation Problem Areas." A soil conservation problem area is a section of land having more or less similar soils and presenting similar problems in soil conservation. A preliminary map of the United States shows that there are 83 such problem areas recognized at present by the Soil Conservation Service and the Soil Science Society of America. Without doubt, with continued study the areas will be better divided and their conservation problems better understood.

There are four problem areas recognized in Florida. A brief description of the areas and the present problems of soil conservation of the areas will be given.

In problem area No. 63 — or the Middle Atlantic Coastal Plains soils — the major problem of soil conservation is the control of surface erosion or the loss of solid and dissolved materials by free wash of water or by wind action. There are about 2,800,000 acres of land in north and northwest Florida including the greater part of the northern half of Escambia, Santa Rosa, Okloosa, Walton, Jackson, Washington, Leon, Jefferson and Madison counties, and all of Holmes and Gadsden counties, which are subject to surface erosion when placed in culture. The upland soils of the area are for the most part fine sandy loams or sandy loams. These are the the red and yellow loamy soils of the general farming area of north and northwest Florida. It is estimated that 75 to 80 per cent of the land has a slope of 6 per cent or less, with the remainder ranging between 6 and 20 per cent. Sheet erosin or the removal of surface soil by water is the most serious conservation problem of the area.

As the principal crops are cotton, corn, tobacco, peanuts and velvet beans — all row crops with clean culture — the conservation problem is mainly one of proper terracing with contour tillage, strip cropping and rotations, using a land cover as much of the year as possible. The proper disposal of surface waters and the retirement of land with steep slopes from culture are also important. The Graceville and Monticello projects of the Soil Conservation Service and the work of the North Florida Experiment Station at Quincy are assisting the farmers of this area in their soil conservation problems by contributing valuable information on the agronomic, engineering, and soil management phases of the work.

Problem area No. 70 — the

(Continued on page 17)

CONTROL OF MELANOSE ON CITRUS

(Continued from page 3)

the way open to melanose infection in injured wood. One of the most important questions in melanose control is, therefore, "How well, and under what conditions, have the trees in your grove carried over winter?" Too many people accept the dropping of leaves and the splitting of wood as the principal effects of cold weather without visualizing the tremendous development of the melanose fungus that is to take place subsequently in the injured wood. Thus, after cold injury to wood, the organism takes hold and it may be several seasons before it can be checked again. In direct attack, the fungus establishes itself on the border-line of wood which is partly injured and yet is striving to live.

In the freeze of December 12 and 13, 1934, the trees in some parts of the state were not only seriously injured, but their recovery was slow and melanose was most active. In March, 1935, on many injured twigs and some of the larger limbs, there was a velvety covering of the tan colored spores often extending a foot or more over the outside surface. Younger twigs were killed outright, but on the older branches many infected areas of **Phomopsis** were established. These "stem-cankers" did not stop growing when the trees started to resume their growth, but rather, they continued to girde and kill larger branches in the cold injured trees until after mid-summer of 1935. After this severe shock of cold to citrus it was evident that the activities of the melanose organism were not controlled so much by what we could do, but were dependent in part on normal recovery of the trees.

In March, 1935, some spraying and pruning experiments were tried. One of the observations of results from these experiments is recorded in Table 1. These trees were Marsh grapefruit about six years old, in excellent condition before the cold. The entire crop was destroyed, defoliation was complete and about 50 per cent of the wood had to be removed. As shown in the table some of the common spray materials were applied after the pruning had been done. Since no crop set, the intensity of leaf infection on the June flush of growth was taken as the index of the relative amounts of melanose present in the various plots. The calibrations used were (1) less than 300 lesions per leaf, (2) over 300 lesions per leaf, (3) yellowed leaves, and (4) dropped or shed leaves. Consideration of only the two extremes of this classfication reveals that the "not pruned and not sprayed" trees (Plot 3 B) had 51.5 per cent of the the leaves shed while only 3.2 per cent had less than 300 lesions on each leaf. The application of a bordeaux 6-6-100 with bentonite spreader and no pruning (Plot 2 B) showed about the same degree of infection on the leaves with 49.8 per cent of the leaves shed and 3.2 per cent with less than 300 lesions per leaf. Pruning alone, or pruning followed by any one of the standard sprays (Plots 1A, 1B, 2A, and 3A) showed a reversal of the preceeding figures with only 1.8 to 5.6 per cent of the leaves shed and with 37.8 to 71.7 per cent of the leaves with less than 300 lesions to the leaf. The bordeax spray following pruning decreased the leaf infection slightly but is too likely to cause serious burning of the younger leaves when applied to this type of growth. These experiments emphasize the prime importance of pruning as a first measure of melanose control in severe cases of infections and particularly following cold injury, whereas spraying failed to give any satisfactory control under these conditions.

The immediate injury due to cold in December of 1934, was carried over into a condition of severe melanose infections which was evident as late as February, 1936. The normal cycle of melanose fungus results in an abundance of spores from about mid-April to the end of June, but this was not the case in 1936 for in February of that year we had an abundant leaf infection of melanose on the spring flush of growth. The only satisfactory explanation of this condition is that there were two distinct cycles of melanose developing and releasing spores in citrus trees which were injured by cold. The first cycle, which caused the heavy leaf infection in February, was started by the December, 1934, cold and was superimposed on the normal cycle, which caused leaf and fruit infections during the spring and early summer. There is no doubt that severe cold injury alters the developments of the melanose fungus and these changes can extend into the second season. The effects of lighter degrees of cold injury may be of importance in starting similar melanose developments but no one is prepared to discuss this point at this time.

The examination of the data which were secured from two different spraying experiments carried on in two groves, about 30 miles apart, in the spring of 1935 indicates a number of things. The grove at Babson Park was injured by cold with what may be termed the "border-line" type of injury; some of the trees lost all of their leaves and some of the wood; other trees shed some of the leaves but no wood injury could be observed. Because of this varied cold injury and because of the general lack of soil moisture in this grove in the spring of 1935, the entire grove was off balance. The growth responses were most irregular, some trees had large leaves, others had small, "mouse-eared" leaves full of melanose lesions. In this grove there were three distinct blooms and setting of fruits. The sprays were directed to check the melanose infection on the second blooming of these trees and were applied the second week in May. The results of the control of fruit blemish are given in Table II. The results in these plots were so irregular due to variations in growth response, cold injury, lack of soil moisture, etc., that they cannot be properly interpreted. One copper spray (Plot 10) gave as good control as two copper sprays (Plot 4); while lime-sulfur showed some degree of control where other sulfurs gave none. These results do not check with other observations.

In direct contrast to these results, are those from the second grove in this same season. A block of grapefruit trees, about the same age as the above, located in Florence Villa, was used. In this block of trees the cold injury was almost negligible, the leaf condition was uniform, the dead wood was relatively abundant, consisting of the finer twigs, with most of the larger dead wood removed, and the lack of soil moisture had been supplemented by irrigation. Under these more favorable conditions there was a uniformity in the responses of the trees. The early bloom which in this season came in Februray, was held on the trees in sufficient abundance to prevent a second bloom. There was a light June bloom which was omitted in taking data. The melanose spray was timed very accurately and was applied on April 17th. As indicated in Table III the results are shown from duplicate plots for each copper spray, the duplicates having slightly different follow-up programs. Irrespective of the follow-up, Coposil produced between 85 and 90 per cent of the fruits with less than 10 lesions per square inch. About the same results

were secured in plots 3 and 4 with Basic-Cop. Cuprocide at the concentration of 1 lb. per 100 gallons with lethane and cottonseed oil as spreader-sticker, gave 94 to 95 per cent of the fruits with less than 10 lesions. Bordeaux in 3-3-100 concentration in plots 7 and 8 showed very close to 95 per cent of these fruits with less than 10 lesions per square inch of surface. The unsprayed checks showed 17 per cent of the fruit in this class.

From these comparisons of data secured the same season from these two groves there can be drawn no definite conclusions as to causes for the variations. In case of the materials and sprays there seems to be little variation, excepting the very important fact that in the Florence Villa block the applications could be timed accurately in respect to the single bloom. This was impossible in the Babson Park grove where there were three blooms. In respect to cold injury and its influence on melanose increase, the Babson Park grove was decidedly in the worst condition. Perhaps in these two groves there is illustrated for us a real, and one of the most important complexes in connection with the melanose control problem. This complex is so common in citrus groves in Florida that we have been ignoring it entirely for years in disease control. There is in Florida a summing up of the totals of effects on trees — which many of us have been considering as natural responses — but which may be described as "cropping strain." It is difficult to define "cropping strain," but in some cases it may be directly traceable to such single factors as, poor light sandy soils, lack of or faulty fertilization, lack of soil moisture, over stimulation to produce abundant fruitfulness, tardy removal of crops, etc. True, every effort is made to avoid these conditions, but all too often the trees are reduced in vitality, vigor and their ability to respond after corrections are applied. In the lowering of these tree conditions — from whatsoever cause you wish to choose or name — again, I must point out that you are predisposing the trees to inroads of disease. The melanose fungus is always present on citrus trees in our climatic conditions and under our system of culture, and the moment citrus trees lose vigor or are cropped beyond their capacities, this organism takes hold of the weakened wood, whether twigs, fruit spurs, water sprouts or other parts —and from these inconspicuous places produces an abundance of spores. Perhaps, as seems to be indicated, at least in part, by the conditions in the two groves which have just been mentioned, the combined effects of excessive cropping and cold injury without irrigation when the soil moisture becomes depleted, may be considered as an ideal combination for establishing abundant melanose in any grove.

There is a third condition of citrus trees which has a very important relationship to the abundance of melanose. It has for years been evident that after severe scale infestations melanose becomes of increasing importance in our groves. This point has been stressed, and the need for careful scale control, especially after copper sprays, can not be over emphasized. It is true that certain agencies of natural control of scale insects are present in most groves, but these agencies are natural checks to extreme populations; they must have a certain scale population before they can work. This certain population which is necessary can and does cause a tremendous amount of scale damage, resulting in dead wood and melanose in considerable abundance in certain seasons. This can be avoided by the regular use of scale control measures.

The foregoing three contributing complexes of conditions; namely, cold injury, "cropping strain," and severe scale infestations, are all very closely tied into the dead wood conditions in any grove. They are strong and underlying modifiers of the melanose conditions in this state. In part they tend to answer: "How well and in what conditions did your trees carry over winter?" They emphasize for you that there are some measures which can be taken to avoid serious melanose. They tend to point out and establish the fact that, since there are causes for dead wood in citrus trees, there must be at times a direct need for the pruning of these trees. This pruning may be essential for tree growth recovery, as after cold injury, and at all times, it must be considered as a supplementary part in the control of melanose.

In speaking of melanose control the very narrow phase of control of this disease may be designated. This narrow phase has as its sole purpose the production of bright fruit. If this is to be the limitation of melanose control, then the entire problem takes on its simplest form; for the dead wood stages where spores are produced can be partly overlooked, the leaf and twig infections may be ignored, and the en-

(Continued on page 15)

TABLE I.

Melanose Infection of leaves in June Flush of Growth, after cold injury. Marsh Grapefruit, showing complete defoliation and about 50 per cent of wood killed. Pruned and sprayed last week in March, 1935. Notes Recorded July 26, 27, 1935. Dr. R. L. McMullen Grove, Largo, Florida.

		Treatments				Conditions of leaves; percentages in following classes						
Plot Nos.	No. of Trees in Plot	Approx. Date Pruned	Spray Applied	Concentration of Spray	Date Applied	No. of Twigs Examined	No. of Leaves on these Twigs	Shed	Yellowed	Over 300 Lesions	Under 300 Lesions	No. Twigs Died Back
1A	15	3-25-35	Liquid lime-sulfur plus Kolofog	2-100 2-100	3-29-35	75	571	5.6	16.3	30.3	47.8	0
1B	10	3-26-35	Dupont No. 2	1 ⅝-100	3-29-35	90	709	2.0	10.2	40.3	47.5	0
2A	12	3-26-35	Bordea'x plus bentonite spreader	6-6-100 1-100	3-29-35	75	618	1.8	11.3	15.2	71.7	0
3A	12	3-27-35				100	792	2.9	23.2	36.1	37.8	0
2B	5		Bordeaux plus bentonite spreader	6-6-100 1-100	3-29-35	100	861	49.8	35.3	3.2		16
3B	3					50	410	51.5	30.2	15.1	3.2	3

Citrus Grove Management

Relation of Grove Practices to Maturity

Telling Of The Experience And Recommendations Of A Prominent Grower, As Related To The Florida State Horticultural Society . . . At Its Annual Meeting In Winter Haven . . .

Harry L. Askew

The subject assigned to me for discussion — "Grove Conditions and Practices in Relation to the Maturity of Citrus Fruits" is one which has been of special interest to citrus growers and shippers since the enactment of our first citrus green fruit laws a number of years ago.

I well remember the outspoken opposition to the first chemical maturity tests for citrus fruit and the apparent willingness and desire on the part of a large number of our high class growers and shippers to evade this law. It was really a sport and a popular past-time and the growers and shippers who were the most flagrant violators were not only NOT condemned, but rather praised and considered smart and a number of our large and high-class operators at that time would boast of the large volume of fruit they had shipped early which would not pass the maturity tests, and these same high-class operators were vain to the extent that they considered such practices as evidence of their superior ability and shrewdness, for at that time the green fruit laws were unpopular even with a number of our honest and high class operators. This condition prevailed for some time, but each year the game of evasion became more and more unpopular as both growers and shippers began to realize the future benefits to be derived from such laws, and finally the situation completely reversed itself and those same high class operators are now among the most enthusiastic boosters for our maturity laws and are the first to condemn any attempt at evasion. I realize that even now we do each season have a certain amount of violations, but I am fully convinced that the day of applauding the violators and calling them smart has passed and pubilc sentiment is definitely in favor of our maturity laws.

The 1934 freeze which came in early December as did the extreme cold weather of this season has created a desire on the part of all growers to move their fruit as early as possible each year and when we remember the fact that so many growers lost their entire crops in 1934 and again in 1937 this desire for the early shipping of fruit which has almost developed into a mania can not be criticized nor condemned, for when our extreme cold in years past came in January and February, there was not the urgent rush to move fruit so early as now exists and if each of us will place ourselves in the shoes of those growers who lost their entire crops in 1934 and again in 1937 and both years in early December, we cannot help but feel that this early shipping mania is at least partially justified, therefore, one of the thoughts uppermost in the minds of a number of our growers is how can I handle my groves so my fruit will mature and pass the maturity test before there is any danger of cold. We realize that if all of the early and mid-season oranges in the state should pass the maturity test in November it would be impossible to move them all each season before there was any danger from cold, so it seems that we will, of necessity, be forced to assume certain cold risks, regardless of the desire of every grower to move his fruit in November.

The use of arsenic on grapefruit has made it possibe for practically all of the seeded as well as seedless varieties to pass the acid tests early, therefore, if we have an early bloom and sufficient moisture to produce the juice requirements, we are all on an equal basis and are able to ship early more palatable grapefruit than the markets will consume at that time.

I have, for years, been an advocate of the use of arsenic on grapefruit, realizing that the sensible spraying with arsenic did no more harm to the trees than our regular sprays of oil, blue stone, zinc, copper and lime and sulphur, but as all of you who have been connected with the industry for as long as 12 to 15 years will recall, there was about that time a very efficient campaign conducted through the state against the use of arsenic and those well meaning, strictly honest opponents succeeded in arousing public sentiment to the point where the legislature passed a law forbidding the use of arsenic. I was at that time rather disgusted and peeved, for I realized that we were giving Texas a decided advantage. It required several years for the industry to realize that a mistake had been made which had cost the state of Florida thousands of dollars, and you will probably recall that a few grapefruit growers brought a suit in Polk county before the Honorable Judge Petteway who ruled the arsenic law as affecting grapefruit was unconstitutional and his decision stands today with reference to grapefruit alone and many of those well meaning leaders who were instrumental in having the arsenic laws passed are today stronge advocates of its use on grapefruit as those of us who continued the fight for its use and were responsible for the Polk county suit.

I think that now since the industry as a whole knows how to use arsenic on grapefruit, we have probably made more progress because of the law and the publicity it gave. I have used arsenic on grapefruit for the past fifteen years. I did not discover its effect on citrus but began experimenting with it after learning of its action or reaction and I am thoroughly convinced beyond a shadow of a doubt that it is a great blessing for Florida grapefruit growers if used intelligently, for those of us who have watched closely know that a lot of our grapefruit will not pass the acid tests even in February unless sprayed, and grapefruit arsenated in the early spring will hold until May or June and instead of becoming insipid really holds its flavor much better than fruit which has not been treated; so any fear that this practice might cause an insipid flavor of grapefruit, late in the season, is unfound-

ed and has been proven to be an erroneous suspicion.

During the time it was a violation of the law to use arsenic on grapefruit, I tried everything anyone would suggest in an effort to sweeten my grapefruit; I put arsenic in my fertilizer, I sprayed with other chemicals, recommended by some of my good chemist friends, I gave my trees hardwood ashes, I gave them one year year, 20lbs. of acid phosphate to the tree, in addition to the regular fertilizer application and many other experiments, but all without any results and if there has been anything found to replace arsenic, I have failed to reach that information, therefore, I am convinced that the proper usage of arsenic on grapefruit will allow the industry to put on the market in November and December grapefruit which is sweeter than it would be in February, had it not been sprayed and with the ever increasing production starring us in the face, it behooves each of us to do everything possible to increase the consumption of grapefruit and it is my belief that this can be done, if we give the consuming pubic sweet grapefruit early in the season.

The major portion of my orange holdings, in the past, have been of the Valencia type and, naturally, I have never interested myself, to any great extent,in the early maturity of oranges, I do, however, at the present time, have, in various groves, a rather large production of Pineapple, Jaffa and other mid-season varieties and, for the past three or four years, I have undertaken to move them early, but am frank to admit that about the only way I have been able to make them mature early enough to pass the maturity test for the Thanksgiving market, is by getting an early bloom and then fertilizing heavily with potash. I have never used arsenic on my oranges, as it has been a violation of the law, since I first began to try to move my early oranges in November, but I have used other suggested sprays and there may be some spray, known to some growers, which will reduce the acid, but all of these sprays, suggested to me and which I have tried, have seemed to have no noticeable effect. I do think, if we are willing to take cold risks we can have our Pineapple and other mid-season varieties of oranges ready for the Thanksgiving market by fertilizing rather heavily in October and November and by irrigating in January, if we have a moisture deficiency at that time. I have one Pineapple grove which I had never been able to move early and, in October of 1935, I gave them an extra heavy application of fertilizer and during the fall and winter of 1935 we had regular rains and in January of 1936 I irrigated this grove thoroughly and secured a late January and early February bloom which did mature early and pass the maturity test and was picked on Nov. 14, 1936. It was my intention the next season to follow this same procedure on this and another grove, but I realized that I might be running a risk by fertilizing in October, so instead, I let the tree go dormant and I did not fertilize until early January and did not irrigate and the bloom was, at least, three to four weeks later than in the previous year, when I fertilized early and irrigated in January, consequently, those Pineapple oranges did not pass the test until too late for the Christmas holiday market, so I am about convinced that in order to make Pineapples and other similar varieties of oranges pass the maturity test early, we must get an early bloom, which I feel we can, if we are willing to have our groves bud and bloom in late January — this can be done with fertilizer and water. I think that practically all of our mid-season oranges, including seedlings, have sufficient juice to enable them to be moved by Thanksgiving, but, because they carry high acids, certain varieties will not pass the acid test, even for the Christmas holiday trade, although they are as well matured as some of the early varieties which are low in acids, and I am wondering if the seedling growers, a large number of whom are now being forced to hold their fruit until after Christmas, are not wondering if the now existing maturity laws are entirely fair to the owners of seedling groves. I am not, at this time, going to advocate the repeal of the arsenic laws, affecting oranges, for, naturally, growers, whose holdings run heavily to Parson Browns, Hamlins and other varieties, low in acidity, would vigorously oppose any arsenical suggestions, but there is certainly food for thought in this suggestion, for I am convinced that, even though Pineapples, Jaffas, Seedlings and other varieties which are high in acid contents, bloom the same day as other varieties which are known to be low in acidity, there is nothing much we can do in the way of fertilizing, cutivating, or spraying which will lower the acidity and make them pass the maturity tests as early as those varieties which are

(Continued on page 16)

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NATIONAL ORANGE PROMOTION PROVES SUCCESS

That the recent National Orange Promotion during February, March and April proved a success is shown by a special bulletin issued by John A. Logan of the National Association of Food Chain Stores.

According to this bulletin the average sale of oranges through the 37,000 member stores was 64 per cent over the same period last year. The increases ranged from 22 to 247 per cent. No company reported a decrease. During the same period, drug chains reported an increase of 120 per cent.

A final report of the Independent Food Distributors Council has not yet been made, but earlier reports indicated that oranges were receiving much needed support from independent merchants.

The bulletin points out that "mass displays in window and inside stores, and advertising of oranges by chain food stores, combined with industry advertising by the Florida Citrus Commission and the California Fruit Growers Exchange, unquestionably produced about as broad a market as was possible."

The National Orange Promotion was conducted by the National Association of Food Chains, the Independent Food Distributors Council, representing 152,000 independent merchants, and the National Association of Chain Drug Stores, with 4,000 units, at the request of the Florida, California and Texas growers in an attempt to market the largest crop on record. What would have happened to the industry without this united effort and co-operation on the part of the nation's food stores and druggists may easily be imagined.

The National Promotion on canned grapefruit juice, requested by the Texas and Florida canners will enter its second stage on August 4th with chain and independent stores featuring grapferuit juice specials. The final weekly promotion in this drive will start on August 25th, with all factors in the trade determined to move this year's stocks before the opening of next packing season.

CITRUS ADVERTISING

The California Citrograph presents a new and telling argument as to the need of a continued and constantly expanding program of citrus advertising, an argument which is just as applicable to Florida or Texas as to California:

"If everyone in the United States can be persuaded to eat just one-fifth of a segment of an orange more every day, California's increased orange production in the next five years can be disposed of, says W. B. Geissinger, Sunkist advertising manager. That means about seven and one-half oranges more a year for each one of us.

"That seems to be a simple task. But remember that the human stomach is just so big. It will hold so much and no more — whether one be millionaire or pauper. A man may have as many suits or automobiles or shoes as he has money for which to pay. But when it comes to food, regardless of his income, his capacity is just so much. He consumes one thing at the expense of another.

"That is one reason why regular consistent advertising is so necessary and important. The ground already gained must be held against strong advertisers and there must be a reaching out for new territory, in this case new consuming stomachs. Think of that if wonder ever creeps into your mind as to whether citrus advertising is necessary and worthwhile."

If there is to be increased consumption of citrus fruits, it must come through increased effort in sales promotion — and sales promotion is based primarily on advertising. It is not enough that we fill the stomachs already accustomed to a citrus diet; we must introduce citrus to stomachs unaccustomed to a diet of oranges and grapefruit —and only judicious, persistent and prolonged advertising will do it.

THE GROWERS' END

Virgil H. Conner, in an article printed in the West Orange News, points out that the average price received by Florida orange growers in the 1936-37 season at all of the auction markets, was $1.24 per box; in the 1937-38 season this had dropped to 9.1 cents per box. During the same seasons, the California grower received $1.18 per box and 2.6 cents per box; a difference in favor of the Florida grower of six cents per box in each of these seasons.

Only the fact that the "tree to market" expense of the California grower is 59 cents per box more than that of the Florida grower enabled the Florida producer to make this showing. Otherwise, the California grower would have been ahead of his Florida competitor.

California, it should be remembered, operated under a controlled marketing agreement which was lacking in Florida. Without such controlled distribution, California could scarcely have weathered the differential in "tree to market" costs.

Study Of Citrus Maturity

Citrus Fruits, Maturity Testing

As Presented In An Interesting Summary Of The Subject At The Recent Annual Meeting Of The Florida State Horticultural Society Held in Winter Haven . . . By . . .

C. E. Stewart

Mr. President, members of the Florida Horticultural Society, ladies and gentlemen. The subject assigned to me for tonight is maturity of citrus fruits.

Maturity is, in my opinion, something everyone is interested in but no one knows much about. Just what constitutes a mature orange is a controversial question. How to grow what we can't exactly define is still more actively controversial. And what to do with this mature article we can't define and can't agree on how to grow, involves further disagreement. This last is so well known that some four hundred agents are able to support themselves by claimng to have something different in the way of marketing. The controversial jumble is made complete when one realizes that with all the brains in the industry no one method has had general approval as the best way to do anything. And out of this clutter of honest opinions some one suggested that I talk about **MATURITY.**

A request from Professor Floyd to serve on this program is a mandate from an honored society and a call that is an honor to receive and obey. So, here I am, to say something about maturity. However my talk has one redeeming feature, as old Artemus Ward once said, "in that what I say has very little to do with the main subject."

The interest in establishing a maturity standard for citrus is, of course, to make citrus groves profitable by protecting the consumer and holding him as a customer. I am not going to bore you with a revue of progress made in establishing maturity tests although I have been in most of it since the early days — days of the real green fruiters — when all we could do was to fix a standard of half color. It has been a long hard road but better fruit is going into the early markets every year.

However, bear in mind one fact in this maturity business — our crops are getting larger and rigid standards tend to shorten the shipping season. Coupled with this is the well known fact that although orders come in with a rush as the season opens there is a lull as soon as the trade has once been supplied. The reasons for this should be equally well known. First, fruit that meets the test may not be so very good to eat. Second, if it has been cooked in the coloring room, it is a poor keeper. Third, if it has been handled properly it is an excellent keeper and will lie on the wholesaler's floor for weeks before breaking down. So the wholesaler is in the position of either having a slow moving fruit on the floor that is sound and he feels must be sold before he buys more or he is pushing fruit that is breaking down rapidly.

Of course, these are the extremes. But there are many varieties of the same situation in between — all unsatisfactory to the trade. I believe this situation develops when we ship a poor eating fruit. Therefore, we must give the consumer a better eating fruit early in the season and this means higher standards. But, you cry, what about further shortening the season? Before I come to that, let me bring out a few more points.

For the last three seasons we have been advertising Florida citrus to the consumers and particuarly to the housewives of America. We have been telling them certain definite things — facts which have interested them greatly and which the most casual check shows have widened our markets tremendously. The definite things we have stressed are the superior characteristics of Florida fruit, forceful statements that a buyer of Florida fruits expects to find substantiated when the fruit is in hand. Therefore, we have been careful not to start advertising until reports showed that fruit was giving satisfaction.

What are these claims we advertise? We publish many recipes and play up the health value and all possible angles but the foundation of it all is, first, juice and second, good to eat.

Let us consider juice first. Immediately the question of grade comes up. At the beginning of the season fruit may pass the test but, perhaps, it may be thrown out on quality. However, if we had the right grading rules this situation would not arise. I have never been in favor of the present grading regulations. They were started about twenty years ago and are based on the California system of grading, which is entirely unsuited to Florida. That is the first point of objection. Second, the names of the grades are unfortunate. I submit that the grade name U. S. No. 2 smacks of second class. I prefer the original gradings — brights, goldens and russetts. These names are distinctly Florida's and a golden is a first-class fruit. When I was with the Exchange we once advertised in this manner — "BUY THE BRIGHTS. They are as good as the russets."

When the present citrus laws were established the Citrus Commission was empowered to set the grades under which fruit would be divided and shipped. I was in that, too, but I didn't get to first base with my ideas about a juice grade. I am firmly of the opinion that an impartial study of this grading situation will show that we are wasting a lot of time and money in the wrong sort of standardization; that our grading is not tuned to our advertising; that it is impossible to tune our advertising to our grading; that we are fooling our consumers; that we are penalizing the producers of the best fruit, fruit that has both fine appearance and fine eating quality.

To attempt to ship a uniform U. S. No. 1 from all sections of the state is impractical. Any fruitman knows that No. 1's from the five main sections of the state, if assembled, can easily be divided into five distinct grades. I know this is unfair to the man packing the best. To the trade a U. S. No. 1 is worth so much, but we know some brands are worth more than others. In a measure, the trade knows this, too,

(Continued on page 13)

Weather And Its Effects

As They Pertained To Florida Agriculture For First Six Months Of 1938—As Outlined By Meteorologist in Charge of The Weather Bureau At Jacksonville, Florida . . .

Walter J. Bennett

After 25 years of dealing with Florida weather, I should know something about it, anyway, the facts and figures on temperature and rainfall which I may give can be accepted. My connection with agriculture, however, has always been indirect, and what I may say along that line has been secured from reports of cooerative observers, crop correspondents, and others, and may be open to objection as hearsay evidence.

The past agricultural season on the whole has been rather unfavorable, for cold weather started very early. Freezing temperatures were reported as far south as Arcadia on November 21, and a real freeze occured on December 7, and 8, with temperature 32° or lower as far south as the Lake Okeechobee region. A number of stations reported the lowest temperature on record for the first half of December. Truck was killed in northern central Florida, and suffered severly even in the extreme south. Considerable ice was reported in citrus fruit in unprotected groves in the northern part of the citrus belt, but cool weather following the freeze apparently favored recovery of the fruit, and the damage was underestimated in December. In January the damage began to show up to a greater degree, as oranges that had been touched by frost were found to be drying out.

From the middle of December until the end of January, the weather was mostly warm and dry, and, on the whole, favorable for winter truck, for citrus, an for strawberries, and, also for tourists. Truck, replanted after the December freeze, made very rapid progress, and truck in the south that had escaped serious injury, made quick recovery. By the latter part of January, large shipments of citrus fruit, strawberries, beans, cabbage, celery, peppers, Irish potatoes, tomatoes, green peas and other winter vegetables were being made.

The third cold spell of the season overspread the state January 27, 28 and 29. Temperatures as low as 32° extended into the southern interior as far down as the Homestead region, but the southern coastal regions mostly experienced temperatures considerably higher. In Sumter and Marion counties the thermometer dropped as low as 23°, while temperatures of 15° to 20° occured in northern and northwestern Florida This cold caused widespread damage to all tender truck in the northern and central sections of the state and considerable damage in the interior of the extreme south. Strawberries were badly hurt, and shipments were suspended for some weeks. Shipments of winter vegetables also were cut short, except from the coastal regions of the south. The cold appears not to have been quite as severe as the one in December, and freezing temperatures were of shorter duration But the damage was considerable to unprotected groves in the northern part of the citrus belt, especially in Alachua and Marion counties where young growth was killed and considerable bloom was frozen. Ice was found in some fruit as far south as Titusville and Clermont. Groves that were fired, in nearly all cases came through in good shape. In Polk county, the heaviest damage was north of Lakeland, and in the Davenport area. The Experiment Station at Lake Alfred recorded 26°. Irish potatoes were frozen to the ground in the Hastings and Bunnell areas, and generally elsewhere in the north.

The cold periods of December and January, although the most severe since December 1934, could not be classified among the great freezes of Florida. Temperatures were not as low as in 1894, 1895, 1899, 1909, 1917, or 1928. The advices given out through radio by the Fruit Frost Service at Lakeland, and through newspapers and telephones by the Weather Bureau offices throughout the state undoubtedly saved much fruit and many young trees and enabled growers in many instances to to protect strawberries and truck.

With the end of January, winter had spent most of its force, and February and March were generally warm and dry, although frosts and temperatures about freezing occured on February 26 in the northern and interior portion of central Florida, with considerable damage to tender vegetables. Truck recovered rapidly from the January cold, and shipments steadily increased, although set back somewhat by the frosts of late February.

The rainfall of December was deficient, and each month thereafter added to the deficiency, especially in the southern and central counties. From the first of December to the latter part of May, the rainfall averaged considerably less than half the normal. The dry weather slowed up the development of spring truck and caused sharp decline in shipments by the middle of May. Citrus groves suffered severly from the drought, leaves wilting and falling, and fruit, both old and new, were dropping badly. Young trees were dying, and by the last week in May, it was said that Peninsular Florida was suffering the worst drought in many years and was threatened with real disaster. The drought was finally broken by good rains the last week in May, which were of inestimable value to the citrus industry. But many young trees had died, and many older trees had suffered shock from which they recovered very slowly. Rains in the latter part of May and June brought the heaviest June bloom that citrus groves have borne in many years. Much of this bloom will set marketable fruit, but how much is still a question.

In northern Florida, the drought was less severe. Cotton made fair growth, and was blooming and forming bolls by the end of June. Boll weevil activity was restricted. Tobacco suffered little from blue mold, and developed and produced a crop of good quantity and quality. Early corn produced a good crop—in some localities said to be the best in five years. Sweet potatoes were planted as soil moisture was sufficient,

and, although late, promise a good crop in both northern and southern sections. By the end of June, figs and grapes were ripening in the north, and mangos and avocados in the south.

The farmer must always reckon with the weather. The past season of cold and drought has been more trying than usual, yet neither cold nor drought brought real disaster. Heating groves and protecting truck is being practiced more and more, and we are finding that although the average annual rainfall of Florida is above fifty inches, yet it is very worth while to have means of irrigation.

STEADY OF CITRUS MATURITY

(Continued from page 11)

but they are in an ideal position to play one brand against the other. Lower brands are not pulled up — the best brands are pulled down. I propose that every shipper has the right to fix his own grades under his own brands. To succeed he must defend them and grade to the best advantage of the fruit in his particular section. To make him grade as the whole state does is unjust and a very stupid procedure.

The state regulation could provide that every box of first grade fruit contain five gallons of juice, second grade four and one-half gallons and third grade four gallons. Less juice would be culls. Then the housewife, enthused by our advertising, encouraged by her doctor, spurred on by her children, would not buy U. S. No. 1's at a good round price and find them perhaps ricey and almost juiceless. What a travesty on a square deal, what a foolish procedure, what a costly and runious system. We know that probably 80 per cent of all oranges are consumed as juice. When we claim and advertise that our fruit is the juiciest, it is our job to see that such oranges get into the better grades and nothing else.

Now, as to the second point — that they are good to eat as is. We advise the drinking of orange and grapefruit juice. We show pictures of fruit dripping directly into glasses. Therefore, the juice of the first fruit shipped must be palatable, it must have a bland flavor, remembering that the consumer has just been having the lush, ripe fruit of late summer and fall and his palate will not react favorably to any harsh acids. In fact, investigation shows that the northerner prefers what we would term insipid fruit. If you doubt this, check it and you may learn one reason why we are losing early grapefruit markets to Texas. These statements, if they are true, and I believe they are, lead to one conclusion. The first fruit must be juicy and bland.

I am in favor of a high test — of raising the test requirements, if necessary. But I am unalterably opposed to shortening the shipping season. On the other hand, I am in favor of using every means at our command to start shipping as early as possible. Perhaps you may have guessed that I am getting around to the subject of arsenic. We in Volusia county never knew it was being used on oranges and tangerines until about last year and then we found that it had been used by some in south Florida for about 15 years. This is also a very controversial subject and I will try to irritate as little as possible those of you who have contempt for the use of arsenic by mentioning just a few points that I consider necessary to complete this short presentation.

It is unfortunate that the name

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of this material has such unpleasant associations. It is known chiefly as a deadly poison. Its therapeutic value is almost unknown to the average man, yet it is a favored stimulant in treating anemia and, as fowler's solution, has a multitude of daily uses. But when we think of arsenic near our beloved oranges we rear back in horror. I wonder if any grower has ever tried blue stone in soup or contemplated what calcium nitrate does to a pair of leather gloves. Yet these violent chemicals are used daily.

Arsenic seems to be tonic to the tree when given in small doses. At any rate, I believe that properly used it will solve our early marketing problem, lengthen our shipping season and give that bland flavor so necessary in our initial offerings. When there is still plenty of acid in the fruit it makes for a fine flavor.

Later in the season on early and midseason varieties it is not so good. However, here is a suggestion. Why not make the users register their grove with Mr. Mayo's department, apply it under his supervision — the grower paying the inspector and such fruit to be off before the first of December? This, of course, does not apply to Valencias. On some varieties arsenic seems to cut down the juice. Well, if we had a juice grade, growers would be careful what they used arsenic on and the consumer would be fully protected. Because of arsenic's bad record as a poison, being involved in murders, suicides, grudge, dog-poisonings and the like, research is directed towards other methods for stepping up maturity. Meanwhile the industry languishes.

I am told manganese will do a lot in a year and a man at Pierson advertises a compound to put on the ground I would like to see an immediate and impartial study of arsenic made at once for this season. I believe J. J. Taylor has sufficient data on file right now to boost a committee through the experimental work. We need bland early fruit. We know how to get it. Let's not be too straight laced to do it.

Maturity is a factor right through the season but my observation is that in some years the trees call their fruit mature when it has not progressed as far in sweetness as it has in other years. This decision on the part of the tree to call it a day is indicated by color and I suggest that color must always be a factor in determining maturity. One hundred and twenty hours in the coloring rooms makes for a lot of mush in the markets and an orange that needs more than sixty hours is a pretty sorry fruit. Such a ruling would also act as a brake on the unscrupulous use of arsenic. Certainly long hours in the coloring rooms have made excessive decay a common thing in the early shipments when our early fruit should be our best carrier.

It is not my purpose to go into a technical presentation but to get it into the record I wish to say that in my opinion the grapefruit test is all right with the exception of the way it operates on small-sized Duncans. The Commission can alter this ten percent either way but I doubt if that will be enough. I believe that on oranges and tangerines there is need for a sliding scale, too. In my county this year the tangerines never did pass in any quantity, even in January. Yet they ate better than those we brought up from south Florida for purposes of comparison. You can make lemonade out of a gallon of water, one lemon and a dash of sugar but you make a better drink with a pound of sugar and enough lemons to make it really tart. That is exactly what happened to our tangerines. There was enough juice and sugar to make them eat well but too much acid for the test. It cost Volusia County untold thousands of dollars. A way to change this before next season must be found. The Commission has no authority, but Mr. Mayo, I believe, would be safe in recognizing a popular demand and an industry need.

Last year Joe Taylor made one of the soundest suggestions ever presented to the industry—a way to stop the mixing of immature fruit with high-test fruit. This is a piece of chicanery that has long been practiced on the innocent consumer. It should be stopped and can be stopped by a simple tolerance of the under-test fruit in any lot. That was Joe Taylor's idea and it was turned down. One wonders why. A housewife who buys a dozen oranges only to find six bitterly sour is a lost customer and a bad advertiser.

The Florida Citrus Commission is starting a well thought out program for a thorough study of this maturity question. We are getting splendid cooperation from all state officers. They are putting their time and funds into it, as well as the support of the Experimental Station. Sound progress is assured. However, I feel that the coming large crop calls for action before this fall, if a major disaster is to be avoided. Grapefruit is in a pretty good spot. Oranges and tangerines are in an entirely different position. If maturity cannot be hastened on tangerines then the test should be lowered to 6½ to 1. Tangerines enjoy a short season and must be moved in that time. Therefore the tangerine test should be taken up at once.

I wonder if the Horticultural Society would like to appoint a committee to report on the present test, methods of getting a longer shipping season, quality of early fruit, grading, etc. No one could possibly question their motives and they have the brains within the Society to do an excellent job.

I believe that is all I have to say. I wish this subject had been given to a more able grower. It deserves the best. However, I thank you for listening.

KEENAN SAYS THE CITRUS INDUSTRY COVERS W I D E TERRITORY

Major Edward T. Keenan, whose company are regular advertisers in The Citrus Industry, states that he has just received a letter from Baruch Shapiro located in Palestine calling attention to the fact that he has been reading Major Keenan's advertisement in The Citrus Industry and inquiring as to the possibility of his setting up an organization in Palestine such as the Keenan Laboratories now maintain in Florida and Texas.

We agree with the Major that such a response is conclusive proof of the power of The Citrus Industry advertising

CONTROL OF MELANOSE ON CITRUS

(Conitnued from page 7)

tire control program can be built around the fruit infection stages. The logical solution would be nothing more than to repeat sprays sufficiently often and to so time them that they would cover the fruit surfaces. If there were no scale complications in this program of citrus spraying, we could repeat the fungicides for melanose control as often as might be necessary, but with the control of scale insects as a necessary requirement, experiences have shown that it is advisable to limit the number of applications of the fungicidal sprays. We therefore assume at present that the limits are not more than two mild fungicidal sprays, in order to make insect control more practical. Under these restrictions for spraying of citrus for melanose, let us examine the relative merits of spraying and pruning for the control of the fruit blemish caused by the melanose fungus.

At the Citrus Experiment Station there is a block of 512 young grapefruit trees planted in 1924-25 to four varieties, namely, Excelsior, Duncan, Marsh and Walters. These four varieties are planted in rotation from north to south in 32 rows, with 16 trees (east-west) in each row. In 1932, we sub-divided these 16 rows of trees into eight two-row plots. These plots were sprayed and pruned in a regular manner for five years and data are available for the last four years of this field experiment. In the arrangement of these plots the two outside plots were not pruned or sprayed. Next toward the center on both sides are two-rowed plots which were sprayed each year; these trees were not pruned. The next two rows on each side were pruned each year, but received no fungicidal sprays. The four central rows of the planting were both pruned and sprayed each season. Sulfur dust was used as needed to control mites.

In 1933 the pruning was done strictly according to commercial practice between the dates of January 30 and February 3. No special empasis was placed on the complete removal of small dead wood. The copper spray for this season was applied on April 24. It consisted of Bordeaux mixture, 3-4-100 with one pound of calcium caseinate added to each 100 gallons of mixture. On June 1-2, a one per cent oil from a commercial oil emulsion was applied to all of the trees which had received the copper spray in April. All the trees of this planting were sprayed with one per cent oil emulsion in October of this season to even up the scale infestations in all plots.

The results for the 1933 season are given at the top of Table IV. These results are in the regular type of tabulation for melanose, giving the five classes of numbers of lesions per square inch as found on the upper check of the fruits — as follows: No lesions; 1-10; 11-25; 26-50; more than 50. The disease situation in this young grove was in accord with the findings in other experimental plots, that is, melanose on fruits was not very severe that spring. The check trees which were not pruned and not sprayed showed a no lesion group of 8.3 per cent. The sprayed trees had 47.5 per cent of the fruits in this same class. The pruned trees without fungicidal spray had 19.3 per cent of fruits with no lesions per square inch. The fruits of the trees which

(Continued on page 18)

TABLE II

Effect of Spraying in Control of Melanose Fruit Blemish O. D. Jaquess Grove, Babson Park, Florida. Crop very irregular and short. (24-26 trees in each plot).Season 1935.

Plot Nos.	Spray Program: Materials	Concentrations	Dates Applied	Percentages numbers of of surface. of fruits showing indicated melanose lesions per sq. in.: No. of fruits examined	No. Lesions	1-10	11-25	26-50	More than 50
2	Bordeaux, bentonite spreader Oil emulsion	3-3-100;½-100 1.25%	May 9-10 July 1	1000	4.5	49.8	30.2	12.9	2.6
4	Bordeaux, bentonite spreader Bordeaux, bentonite spreader Oil emulsion	3-3-100;½-100 3-3-100;½-100 1.25%	May 10 June 4 July 1	1000	18.7	68.4	9.6	3.0	0.3
5	Liquid lime-sulfur Kolofog Liquid lime-sulfur Kolofog Liquid lime-sulfur Kolofog	2½-100;2-100 2-100;3-100 1⅔-100;4-100	May 11 June 3 July 3	1000	1.4	46.8	25.2	15.2	10.8
6	Dry lime-sulfur, Kolofog Dry lime-sulfur, Kolofog Dry lime-sulfur, Kolofog	5-100;2-100 5-100;2-100 5-100;2-100	May 13 June 3 July 3	100	0.4	17.5	22.5	39.9	19.7
8	Bordol-emulsion, bentonite spreader Oil emulsion	1-50;½-100 1.25%	May 9 July 2	1000	2.2	61.1	26.3	8.0	2.4
9	Basic cop bentonite spreader Liquid lime-sulfur, Kolofog Liquid lime-sulfur, Kolofog	3-100;½-100 2-100;3-100 2-100;3-100	May 10 June 3 July 2-3	500	9.2	61.7	17.8	8.0	3.3
10	Basic cop. bentonite spreader plus oil emulsion Oil emulsion	3-100;½-100 0.6-100 1.25%	May 11 July 2	1000	15.9	68.5	12.1	2.8	0.7
12	Check (unsprayed)			1000	0.3	9.9	25.1	40.7	24.0

GROVE CONDITIONS AND PRACTICES IN RELATION TO THE MATURITY OF CITRUS FRUITS

(Continued from page 9)

NO MORE MATURE, but which are low in acidity. I do hope and trust that sometime in the future, some ways and means may be found for lowering the acidity in seedlings and other mid-season varieties which are fully matured in December, but which will not pass the acid maturity test for the use of "Color Added" until late in January.

I am not a heavy producer of tangerines, but those I do produce are a real problem. You will recall the test on tangerines this season was raised from a ratio of seven to one to a ratio of seven and one-half to one, and, I am not criticizing this change, for I realize that a sour tangerine is about the poorest thing in citrus that we could offer the consuming public and even a tangerine which passes the present existing maturity test of seven and one-half ratio to one is still rather sour and tart and why the public still consumes such a large volume in November and December is a mystery to me and convinces me that there is a real place in the picture for our tangerines and if these tangerines were sweeter in November and December and would pass an acid test of eight or even eight and one-half to one ratio, I think we could reasonably expect a much larger volume to be consumed early in the season, but we know that we cannot expect tangerines to pass a test of this kind in November and December.

Prior to last season, the required state maturity test on tangerines was a ratio of seven to one and when tangerines reached that point, we naturally ceased making tests, and now I am wondering and concerned to learn if tangerines on rough lemon root on high pineland will ever pass the present maturity requirements in time for the holiday trade. In discussing this situation with a number of the leading packers in my territory, they seem to be of the opinion that our present maturity test on tangerines are too high in order to move a large volume for the holiday trade, but not too high in order to assure us of having palatable tangerines and even admitting that they would be much more acceptable if they could pass a test of even eight and one-half to one ratio. My observation has been that tangerines are more or less a holiday fruit, but, since we are spending five cents per box on the state's output for advertising purposes, it may be possible to extend the heavy consuming period after the holidays and into January and February, but those growers who are familiar with the situation know that our tangerines, on rough lemon root, begin to show dryness rather early after the holidays, and, naturally, when this condition begins to develop there is a rush to move these tangerines, regardless of price conditons.

A number of my good friends, last Spring, sprayed their tangerines with a very small amount of arsenic, using only from three to four ounces to the one hundred gallons of water and I understand that their sprayed tangerines passed an acid test of from eight to nine ratio to one in November and December and those friends not only received a good price for their tangerines, not only moved them from their trees before any chance of dryness, but gave the public a real sweet tangerine, a much better fruit than those which would just barely pass the ratio test of seven and one-half to one. A large amount of tangerines were never shipped this season because they began to show dryness before they would pass the even present low maturity test of seven and one-half to one, but even so, I would not, at this time, recommend reducing the test to the old standards of a ratio of seven to one, but, unless there are some good arguments which I have not heard, I can see no reason who some constructive study should not be made of the arsenic effects on tangerines.

I realize these remarks will be criticized by a number of my good friends, who are constitutionally opposed to even the word "arsenic," but those growers who did use arsenic last year, if promised immunity, should be able to give convincing testimony as to the superior eating qualities of sprayed tangerines and if it be true that a light application of arsenic — not over three or four ounces to the one hundred gallons of water — will cause tangerines to pass a ratio test of from eight to nine to one during the holiday season, then it seems to me that the leaders in the industry should, by all means, get together and before the convening of the next legislature, arrange to make some changes in our arsenic laws. Spraying tangerines should not cause the same objections to be raised that might justly be raised in connection with spraying oranges with arsenic, for so far as I have been able to determine, we do not have in tangerines what is known as a strictly early variety, such as the so-called early varieties of oranges — Parson Browns, Hamlins, Walkers, Norris Seedless, and the numerous other **so-called** early varieties. Tangerine producers of the state are now on an equal basis and if the laws were changed to permit the spraying of tangerines, no grower could claim that such practices were detrimental to his interests, because of the fact that he had a natural early variety of tangerines which would pass early the now exsiting state maturity tests.

It is the desire of practically every grower to move his tangerines in November and December, partially on account of the cold risks, and partially on account of the possibility of his tangerines showing dryness and becoming puffy, if held until late January or February, and we all know from experience, that we receive more money for our tangerines if shipped in time for the holiday trade. If, by using a small amount of arsenic on our tangerines, we can make them sweet for Thanksgiving and Christmas and thereby be able to move probably twice as many during that period as we have

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been accustomed to in the past, then it appears to me that we should certainly begin, immediately, to give some thought and study to this situation and arrange to give this information to the tangerine growers of the state.

I have made several natural efforts to mature tangerines early, but without any great amount of success. This past season, or rather the season just coming to a close, my tangerines bloomed early and regular and I thoaght that I would be able to move a goodly portion of them for Thankgiving, but, much to my surprise, they did not even pass the new test of a ratio of seven and one-half to one in time for the Christmas holiday trade and, consequently, on account of dryness and a puffy condition, I lost around 3000 boxes. It might be said that this early dryness and puffy condition was due to our extreme cold weather, but after a number of years of raising tangerines, I am convinced that we growers who have them budded on rough lemon root and planted on high pineland, cannot afford to hold them until late January or February. I now have an extreme early bloom and have irrigated them twice already and have given them an application of fertilizer, running high in potash, and shall watch with a great deal of interest their maturity this fall.

I regret exceedingly, that I am unable to give to the growers any particular cultivation or fertilization formula for hastening the maturity of either oranges or tangerines, but I do think that the system, used by my old Uncle in south Alabama, might well be used to advantage by some of we Florida citrus growers — when being asked for his formula for raising such fine crops of cotton, corn and oats each year, he replied that the only system he used was: "Early to bed, early to rise, work like Hell and fertilize."

In closing, I wish to compliment Mr. Mayo, Mr. Taylor and their high class organization on the most excellent packing house inspection work they have been doing for the past several years. Mr. Mayo has been able to give his men longer employment than in the early days of the Inspection Service and has been able to build a high class, highly respected organization and I feel that his inspection personnel has had considerable influence and much to do with crystalizing public opinion in favor of our maturity laws.

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SOIL CONSERVATION PROBLEMS IN FLORIDA

(Continued from page 5)

Coastal Flatwoods soils — is the most extensive in the state. There are approximately 22,350,000 acres of these poorly drained soils. They vary greatly in character from the fertile black loamy soils with a limestone base, to the light gray infertile "crayfish" or "crawfish" soils.

The problems of soil conservation in this area are thus numerous and varied in character. Perhaps one of the most important of these problems is the maintenance of proper water relationships in these soils, particularly when they are drained and placed in culture. Other problems are the adaption of these soils to forest trees and to grasses, which involves a basic study of the uncontrolled grass and wood fires and their effects on the soil and vegetation. Perhaps no other area of the state has been abused and misused as this extensive area of poorly drained soils — and without doubt we know less of the fundamental conservation problems of this area than of any other part of the state.

Problem area No. 77 includes the Florida rolling sandy lands. There approximately 7,560,000 acres of these porous sandy soils in north and west Florida and in the north-central, central, and west-central and ridge sections of the state. These deep sandy soils in sections are directly over porous limestone formations which shift or slump, thus affecting the soil. The sands are subject to degradation thru the movement of solid and dissolved materials downward thru the soil mass under the influence of percolating waters, excessive areation, and other factors. They are subject to excessive leaching of plant nutrients during the rainy seasons and to drought during other seasons. It is difficult, to almost impossible, to maintain the organic matter content of these porous soils when they are cultivated. After the removal of the original stand of long leaf pine it is almost impossible to reforest these soils. They represent a unique and important soil problem, particularly in the subtropical climate of Florida.

The fourth problem area is No. 83 — the Peat and Muck lands. The principal areas of these organic soils are approximateley 2,270,000 acres in extent. The Everglades area is the largest and most important. With the drainage of the Everglades, Florida was faced with one of the most immediate conservation problems known. Subsidence of the organic soils, due to the decomposition of the organic matter, compaction, burning, and other causes, is rapid during the first years of drainage. Losses of elevation of four to five feet in the first twenty years following original drainage, and one foot for the next ten years may be expected according to B. S. Clayton, Assistant Drainage Engineer of the Bureau of Agricultural Engineering, U. S. Department of Agriculture. Mr. Clayton made his studies in the Everglades area.

Considering that only 100,000 to 125,000 acres of the Everglades is under cultivation at present, the losses from these fertile organic soils outside of the cultivated area is appalling. The problem of conservation of these soils is thus a managed problem of water control to keep as much of the soil under water as possible. There are many other angles to the problem, but with these few remarks I have tried to impress the seriousness of the situation with regard to the conservation of our potentially fertile organic soils.

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Washington, D. C.

Registered Patent Attorney

CONTROL OF MELANOSE ON CITRUS

(Continued from page 15)

were both pruned and sprayed had 86.2 per cent in this class. If we allow a tolerance of ten or less lesions per square inch of surface for a theoretical first grade of fruits, then the check would show 76.1 per cent; the sprayed but not pruned, 92 per cent; the pruned but not sprayed 91.5 per cent; the pruned and sprayed trees 98.8 per cent. In this season of mild infection and with this grove in its 9th year, the pruning was equal to the spraying for melanose control. The combined operations produced fruits which were very nearly free of melanose blemish; they were about 99 per cent of approximate first grade.

In the repetition of these operations in 1934 there were a few minor changes in materials and timing. The eight central rows of trees were pruned on February 13-14. There was very little dead wood which had been established during the preceding year and most of this was of the smaller types. The spray for this season was a Bordeaux 6-8-100 with one pound of calcium caseinate to each 100 gallons, applied on April 17. On the trees which received this copper spray, an oil emulsion using 1.3 per cent actual oil, was applied during the last week in June. No general oil spray was applied to the entire planting in that season.

The records from this planting (Table IV, second series) confirm the general observations for 1934, that melanose was very severe as a fruit blemish in that year. The trees which were not pruned and not sprayed (checks) showed no fruits free of lesions; this was also when the trees were pruned but not sprayed. On the other hand the spraying produced 28.5 per cent of fruits showing no lesions per square inch, and the combined pruning and spraying produced 56.9 per cent in this same class. In approximate grade, the check trees showed about 20 per cent of fruits which had more than 50 lesions per square inch; these can be considered as culls or cannery fruits. Any and all of the other operations, whether pruning or spraying, eliminated this grade entirely. This season the spraying was more effective in producing first grade fruits (less than 10 lesions per square inch); 92.5 per cent were totaled for this class, after the spraying alone. The pruning operation, alone, produced slightly less than 50 per cent in this class. The combined spraying and pruning again produced 98 per cent of the fruits in first grade.

In 1935, because of the cold weather and some damage to those trees, especially in the north half of the planting, the pruning operations were not started until late in March. The dead wood was abundant and of the larger types. That spring the Bordeaux was 3-3-100 concentration with 1-200 bentonite

TABLE III

Effect of Spraying in Control of Melanose Fruit Blemish. Swann Grove, Florence Villa, Florida. Crop regular, trees under irrigation. (10-12 trees in each plot). Season 1935.

Plot Nos	Spray Program: Materials	Concentrations	Dates Applied	Percentages of fruits showing indicated numbers of melanose lesions per sq. in. of surface. No. of fruits examined	No. Lesions	1-10	11-25	26-50	More than 50
1	Coposil, coll. spreader, oil emul. Dry Lime-sulfur, Kolobrite Dry lime-sulfur, Kolobrite	3-100;½-100;1 qt.-100 5-100;3-100 5-100;3-100	Apr. 17 May 14 June 29	1000	22.9	66.1	9.6	1.3	0.1
2	Coposil, coll. spreader, oil emul. Dry lime-sulfur, Kolobrite Oil emulsion	3-100;½-100;1 qt.-100 5-100;3-100 2-100 (1.5% oil)	Apr. 17 May 14 June 29	1000	17.7	67.6	10.3	3.3	1.1
3	Basic cop. coll. spreader, oil emul. Dry lime-sulfur, Kolobrite Dry lime-sulfur, Kolobrite	3-100;½-100;1 qt.-100 5-100;3-100 5-100;3-100	Apr. 17 May 14 June 29	1000	20.7	67.0	11.0	1.3	0.0
4	Basic cop. coll. spreader, oil emul. Dry lime-sulfur, Kolobrite Oil emulsion	3-100;½-100;1 qt.-100 5-100;3-100 2-100 (1.5% oil)	Apr. 17 May 14 June 29	1000	25.3	65.0	8.4	1.1	0.2
5	Cuprocide, lethane, cottonseed oil Dry lime-sulfur, Kolobrite Dry lime-sulfur, Kolobrite	1-100;1 qt.-100;1 qt.-100 5-100;3-100 5-100;3-100	Apr. 17 May 14 June 29	1000	25.4	69.5	4.4	0.7	0.0
6	Cuprocide, lethane, cottonseed oil Dry lime-sulfur, Kolobrite Oil emulsion	1-100;1 qt.-100;1 qt.-100 5-100;3-100 2-100 (1.5% oil)	Apr. 17 May 14 June 29	1000	27.3	67.5	4.0	1.1	0.1
7	Bordeaux, coll. spreader Dry lime-sulfur, Kolobrite Dry lime-sulfur, Kolobrite	3-3-100;½-100 5-100;3-100 5-100;3-100	Apr. 17 May 14 June 29	1000	36.3	57.9	4.6	0.8	0.4
8	Bordeaux, coll. spreader Dry lime-sulfur, Kolobrite Oil emulsion	3-3-100;½-100 5-100;3-100 2-100 (1.5% oil)	Apr. 17 May 14 June 29	1000	34.0	61.6	3.4	0.8	0.2
9	Dry lime-sulfur, Kolofog Dry lime-sulfur, Kolofog Dry lime-sulfur, Kolofog	5-100;3-100 5-100;2-100 5-100;2-100	Apr. 17 May 14 June 29	1000	20.1	53.5	14.2	7.1	5.1
10	Check (unsprayed)			1000	0.0	16.9	22.0	30.1	31.0

spreader. It was applied on April 16th. Oil spray, following this copper, was applied the first two days in July at 1.25 per cent actual oil. To again equalize the scale insect infestations the entire planting of 512 trees was sprayed between November 7 to 9 with a 1.25 percent actual oil spray.

In making the records of melanose fruit blemish control for this season, we thought it best not to include the fruits from the north half of these plots; this would eliminate the trees which were severely injured by cold and avoid complications of the direct effects of the operations with this cold injury factor. The results from the south half of the planting are given in Table IV, series three. In the check trees, not pruned and not sprayed, the fruits with no lesions, were about 2 per cent; the first grade about 42 per cent, and the culls about 11 per cent. Without pruning, the spraying operation as applied this spring, had about 20 per cent of the fruits with no lesions to the square inch; close to 80 per cent in first grade, and about 1 per cent culls. The pruning operation without any fungicidal spray was equal in fruit appearance; about 17 per cent with no lesions per square inch; close to 82 per cent in first grade, and less than 1 per cent culls. The combined pruning and spraying showed about 50 per cent with no lesions; 98 per cent first grade, and no cull fruits.

The pruning operations in 1936 were purposely delayed to the last two weeks in March. This time of the year may be considered as a poor time to prune, but we had secured some results in 1935, especially in view of the cold injury, which might be interesting if they could be duplicated. In 1936, the dead wood was practically all of the finer, small twig and fruiting spur, types. No effort was made to remove all of it. The pruning was strictly on a commercial basis. The spray applied on April 6th was Bordeaux 3-3-100 plus 1 pound per 100 gallons of bentonite spreader. Following this copper spray, these trees received a 1.25 per cent oil on July 2-7. No oil was applied later that season.

The results for 1936 are the final series in Table IV. Melanose was slightly more abundant on fruits from these trees in 1936 than in 1935. The trees which were not pruned and not sprayed showed no fruits without lesions; 33.5 per cent of these fruits can be considered as first grade and about 15 per cent as culls. The spraying operation produced fruits with 15.4 per cent free of lesions; about 88 per cent first grade, and less than 1 per cent culls. In the pruning, without spraying, the degree of melanose fruit blemish control was less than in spraying without pruning. The pruning, alone, produced fruits with 3.4 per cent free of lesions; about 66 per cent in first grade, and 3.4 per cent culls. The combined pruning and spraying showed, as in all the previous years, 98 per cent of the fruits in first grade and practically no culls.

The results of four years experiments for melanose control by pruning and spraying show several important facts. Over this period of time, the culls, or fruits with more than 50 lesions per square inch, were between 2 per cent and 20 per cent from the trees which were not pruned and not sprayed. In trees of this age, in two seasons of the four, the pruning was as effective as the spraying for melanose control; in the other two seasons the spraying was more effective than the pruning. The spraying seemed more reliable for consistent control than pruning. Maximum results in melanose control, close to the production of 98 per cent of first grade fruits, was secured in all four years when the pruning and spraying were combined season after season. The trees in this experiment were between their 9th and 12th years in grove planting; starting at the age when melanose begins to be of importance in grapefruit under ridge conditions.

The above series of field experiments does not cover the conditions which are met with in older groves. Unless the older grove is exceptionally well located and handled with reference to soil, climate, irrigation and fertilization, there is bound to be dead wood established. Pruning is expensive under poor grove conditions and it seems to be far less

(Continued on page 22)

TABLE IV

Effect of Spraying and Pruning in the Control of Melanose Fruit Blemish Four Varieties of Grapefruit. Trees 9 to 12 Years Old, Citrus Experiment Station, Lake Alfred, Florida.

Season 1933

Treatments						Percentage of fruits showing indicated numbers of melanose lesions per sq. in. of surface.					
Bordeaux				Oil*							
Plot Nos.	Date of Pruning	Concentrations	Dates Applied	Concentrations	Dates Applied	No. of fruits examined	No. Lesions	1-10	11-25	26-50	More than 50
1,8						2688	8.3	67.8	15.4	6.3	2.2
2,7		3-4-100	4-24	1%	6-1-2	2516	47.5	44.5	6.1	1.5	0.4
3,6	1-30 to 2-3					2613	19.3	72.2	6.9	1.3	0.3
2,5	1-30 to 2-3	3-4-100	4-24	1%	6-1-2	1902	86.2	12.6	1.1	0.1	0.0
Season 1934											
1,8						4000	0.0	22.1	34.1	24.3	19.5
2,7		6-8-100	4-17	1.3%	6-28-29	4000	28.5	64.0	6.9	0.5	0.1
3,6	2-13-25					4000	0.0	46.8	44.3	7.3	1.6
4,5	2-13-14	6-8-100	4-17	1.3%	6-28-29	4000	56.9	41.0	1.9	0.1	0.1
Season 1935											
1,8						4000	1.8	40.7	25.8	20.8	10.9
2,7		3-3-100	4-16	1.25%	7-1-2	4000	20.3	58.9	14.9	4.7	1.2
3,6	3-20 to 4-6					4000	16.8	65.3	14.2	3.3	0.4
4,5	3-20 to 4-6	3-3-100	4-16	1.25%	7-1-2	3500	49.4	48.8	1.7	0.1	0.0
Season 1936											
1,8						4000	0.0	33.5	27.9	23.5	15.1
2,7		3-3-100	4-6	1.25%	7-2,3,7	4000	15.4	73.2	9.0	2.0	0.4
3,6	3-12-27					4000	3.4	62.9	21.5	8.8	3.4
4,5	3-12-27	3-3-100	4-6	1.25%	7-2,3,7	4000	27.5	70.5	1.6	0.4	0.0

* Applications of oil made in autumn of 1933 and 1935 (See text for details)

Four Surplus Purchase Programs Continued For 1938 Fiscal Year

Four programs under which price-depressing surpluses of farm products have been made available to the States for relief use, were approved by Secretary of Agriculture Wallace for continuance during the fiscal year which began July 1, the Agricultural Adjustment Administration announced recently.

Under the programs, the Federal Surplus Commodities Corporation will have authority to continue to buy when necessary during the current season surpluses of oranges, fresh peaches, vegetables grown in the northeastern states, and wheat and wheat products including flour and cereals. These products will be bought when prices are low to help improve market conditions and to encourage domestic consumption through distribution for the use of the needy and unemployed.

Quantities bought will depend upon the market situation confronting producers and upon the ability of the States to handle supplies for relief use.

Purchases of surplus farm products are provided for by section 32 of the 1935 amendments to the Agricultural Arjustment Act. This provision of law makes available to the Secretary of Agriculture an amount equal to 30 per cent of annual customs receipts for uses which include encouraging domestic consumption, developing new domestic and foreign markets, and new uses for surplus farm products.

CITRUS GROVES STUDIED FROM THE AIR

The latest way to study citrus grove conditions is from the air. By photographing from the air, conditions in the groves can be observed which might not ordinarily be seen in surface inspection. Perhaps one area in a grove will show up different at one observation than at another, and another area will be the same at both observations. This would show that differences in the areas of the groves were inconsistent, and would furnish valuable food for thought and study.

Another consideration in this aerial survey might be droughts and their effects. A drought at one time might drastically affect one area, while a drought at another time might not have any effect whatever on this same area, but on another area. This would mean that the cause of the condition was not chronic.

The Keenan Soil Laboratory, Frostproof, Florida, has recently purchased a Fairchild "24" to aid in their scientific study of grove conditions. Their plane is powered with a 145 horsepower Warner engine, and has a cruising speed of 120 miles per hour. It is licensed to carry three passengers and 170 pounds of baggage.

This is probably the first time that aerial survey of grove conditions has been used seriously in the state, and should have big possibilities as an aid to grove men.

RESULTS OF FEDERAL TRADE COMMISSION'S TWO-YEAR INVESTIGATION OF AGRICULTURAL MARKETING.

(Continued from page 4)

effect than is generally possible at private sale. In auction selling the merchandise goes to the highest bidder, and as a general rule, no buyer who has the necessary cash or credit is excluded from making purchases.

"The auctions appear to adjust prices more effectively to supply and demand."

Some of the allegations heard against the auction market method of selling were complaints in respect of favoritism of large shippers. Some auction companies, it was claimed, made greater efforts to sell the products of large shippers than of small shippers. this, the commission found, was untrue and the auction officials strenously denied it.

"Some auction officials," the report alleged, "acknowledged that the juice grape auctions were not always highly regarded but put the blame for this on the shippers whom they said made little or no effort to effect orderly marketing of their grapes."

In a consumer cost analysis, the commission divided a typical consumer dollar paid for agricultural products on this basis: In nine markets the following divisions were found paid for Florida oranges — proceeds to growers 29.65 cents; packing, picking and loading costs, 19.55 cents; margins of merchant shippers and brokers for growers, 1.47 cents; freight and other transit costs, 14.44 cents; wholesale receivers' margin, 2.41 cents; retail margin 32.47 cents; other costs 0.01 cent.

Improvement of the unsatisfactory conditions calls for action on a large scale, the commission believes, and recommended cooperatve studies to be undertaken by state and federal authorities, passage of new laws and more stringent enforcement of those in existence.

At the present time there are two bills based on the findings of the commission before the House of Representatives agricultural committee. These were proposed by Congressman B. W. Gearhart, 9th district, California, and are designed to correct several of the alleged abuses.

One of Gearhart's bills provides for the designation of principal terminal markets by the secretary of agriculture, with department inspectors, and the other for jurisdiction over freight damage claims by the Interstate Commerce Commission.

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Grapefruit Price Trend Dropped With Increased Production

While Florida now produces an average of twice the amount of grapefruit as it did in the early twenties, on-tree returns to growers per box of fruit are about half as great, according to figures released by the State Agricultural Extension Service.

In the three seasons beginning with the 1920-21 crop, Forida grapefruit production averaged 6,851,000 boxes and the on-tree price averaged $1.29 per box.

In the next 3-year period average production rose to 8,591,000 boxes and the on-tree proce fell to an average of 94 cents per box. During this period the grapefruit industry felt the effects of the 1924 depression, and in all probability returns to growers fell lower than they would have fallen if more normal conditions had prevailed.

Florida grapefruit production increased to an average of 9,388,000 boxes in the 3-year period beginning with the 1926-27 season. In this 3-year period, no appreciable increase in the average production took place, whereas a significant increase in consumption purchasing power occurred. The on-tree price averaged $1.28 for the period.

Production for the 3-year period beginning with the 1929-30 crop climbed to 11,723,000 boxes and the average on-tree price fell to 89 cents. The industry's first big crop, 16,109,000 boxes, came in the 1930-31 season of that period.

The crop averaged 12,567,000 boxes in the 3-year period beginning with the 1932-33 crop and the on-tree price average dropped to 50 cents. The average on-tree price for this period fell below the general downward trend of Florida grapefruit prices, principally because of the 1932 depression and the 15,200,000 boxes produced in the 1934-35 season.

Average production of Florida grapefruit for the 3-year period beginning with the 1935-36 season exceeds 14,000,000 boxes, with an average on-tree price slightly over 65 cents per box.

BOOK FOR CITRUS GROWERS

The control of citrus insect pests constitutes one of the most important and most expensive operations in citrus culture in most parts of the world. An acquaintance with these pests, particularly as to their identity, their ways of life, and the methods available for control, should be an important part of the knowledge of every successful citrus grower.

All phases of this subject are discussed in a book just announced entitled "Insects Of Citrus And Other Subtropical Fruits," by H. J. Quayle and published by the Comstock Publishing Company, Ithaca, New York. While the book is based on citrus conditions in California mainly, Quayle has spent three years outside of California in the study of citrus pests in all of the chief citrus sections of the world. With the cooperation of entomologists concerned he has given an authoritative account of the citrus pests in the various countries.

FOR SALE

Lists of Florida Citrus Growers compiled from recent survey of groves, arranged by counties. Names, address, acreage and legal description.

Also List Wealthy Residents of Florida

National Survey Co.

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ATLANTA, GA.

VIRGINIA - CAROLINA CO., MOVES OFFICES TO ORLANDO

R. O. Ferrell, manager of the Virginia - Carolina Chemical Company in Florida, announces this week that the Florida sales offices of the company, which heretofore have been in Jacksonville, will be moved to Orlando on August first.

The company offices will be located in the Gentile building in Orlando to make their future headquarters.

The factory will continue to be located in Jacksonville as has been the case in the past.

More fruits and vegetables are being canned by Calhoun County farm women and girls this year than in 1937, according to Miss Eloise Chapman, home agent.

Indian River Citrus In New Sales Set-Up

Independent East Coast Group Enters Field for Coming Season

Charter was granted July 14 by Secretary of State Gray to Indian River United Growers, Inc., with headquarters at Indian River City, as a non-profit stock cooperative. The incorporators are O. Foster Brown of New Smyrna, Frank G. Clark and Geo. C. Olmstead of Indian River City, and Ralph Boswell of Orlando. Permanent organization will be competed this month and directors chosen on a plan representative of the entire district.

A separate but affiliated sales organization to handle Indian River fruit exclusively and only the fruit of the United group is being incorporated. As most of the tonnage already signed up lies in that part of the district between Daytona Beach and Vero Beach, offices of the sales department will likely be located centrally in Cocoa or Melbourne, where complete teletype service will all citrus markets will be maintained.

Objects of the new organization are "to secure packing of members' fruit at actual cost and the creation of a sales organization to handle Indian River fruit exclusively through F. O. B. sales and in the auction market, selling at auction only such fruit as cannot be sold advantageously through F. O. B. orders."

It is planned to have the lower grades of fruit handled in bulk with no packing charge and only a nominal charge.

Further aims of the new group include the allocation of advertising money collected by the Citrus Commission from Indian River growers for advertising Indian River fruit.

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WINTER HAVEN, FLORIDA

CONTROL OF MELANOSE ON CITRUS

(Continued from page 19)

effective in controlling melanose in older trees than in younger trees. This may be illustrated by the results secured at Largo in 1934. The trees in this field experiment were seedling grapefruit in their 25th year. Dead wood had accumulated for at least ten years. Melanose was as severe in these trees as any place in this state. The details of operations in these older trees in both pruning and spraying are reported for 1934 in Table V. Dormant Bordeaux-oil followed by Bordeaux 6-8-100 in April followed by oil in May, produced, on trees which were not pruned, very slightly better results than the April application of Bordeaux 6-8-100 followed by oil. Pruned trees (plot 1) when sprayed with Bordeaux in April were almost free of fruit blemish. Pruning alone, at least the first season after this operation, (plots 5 and 6) did not greatly increase the bright fruits, although it reduced the cull fruits (with more than 50 lesions) about 25 per cent. Two applications of 3-3-100 Bordeaux were more effective in control than a single application of 6-6-100 Bordeaux. The single application of half strength Bordeaux was less effective than a 6-6-100 Bordeaux, but either was relatively effective in reduction of the cull group of fruits. Under these seasonal conditions in these old grapefruit trees, practically no fruits of first grade were secured from the non-sprayed and non-pruned trees and about 50 per cent would have to be considered as culls or cannery grade.

(To Be Contnued Next Month)

SWEET MANGO RELISH

Peel green mangoes, cut from seed, chop or put through coarse blade of food chopper enough to make one quart. Chop or grind two large onions, six sweet red peppers, and two large hot peppers. Add 1 tablespoon white mustard seed and celery seed, 4 cupsful sugar, and 1 cupful vinegar. Also add two cupfuls raisins, if desired.

Combine all ingredients. Bring to boil and boil 5 minutes. Let stand over night. Next morning, cook until slightly thickened (about 10 minutes). Pack boiling hot and seal. Mango may be combined with sweet fruits as papaya or pineapple for making jams and other products.

Purchase of surplus Florida oranges to be made available for relief use in the various states will be continued by the Federal Surplus Commodities Corporation during the fiscal year which began July 1, 1938, says a report from the Agricultural Adjustment Adminis tration in Washington to the State Agricultural Extension Service.

CLASSIFIED Advertisments

The rate for advertisements of this nature is only five cents per word for each insertion. You may count the number of words you have, multiply it by five, and you will have the cost of the advertisement for one insertion. Multiply this by the total number of insertions desired and you will have the total cost. This rate is so low that we cannot charge classified accounts, and would, therefore, appreciate a remittance with order. No advertisement accepted for less than 50 cents.

WANTED — Two thousand sweet seedling root stock, lining-out or better. H. M. Sherwood, Fort Myers, Florida.

FOR SALE—2000 Riverside No. 10 Grove Orchard Oil Heaters used only two seasons, excellent condition. 70c each, F.O.B. Marianna subject to prior sale. Marianna Fruit Company, Marianna, Fla.

ALYCE CLOVER SEED. Ripe and cleaned. Ideal cover and hay crop, Write for information. P. E. Synder, Box 866, Lakeland, Fla.

SEEDS—ROUGH LEMON, SOUR ORANGE, CLEOPATRA. Pure, fresh, good germination. Also seedlings lineout size. De Soto Nurseries, DeSoto City, Fla.

SCENIC HIGHWAY NURSERIES has a large stock of early and late grapefruit and oranges. One, two and three year buds. This nursery has been operated since 1881 by G. H. Gibbons, Waverly, Fla.

THRIFTY TREES and budwood from record performance Perrine Lemon parents. Persian Lime and other citrus varieties. DeSoto Nurseries, DeSoto City, Fla.

STANDARD Varieties of citrus trees including Persian limes and Perrine lemons at reasonable prices. Ward's Nursery, Avon Park, Fla.

MANURE — Stable and Dairy Manure in car lots. Write for prices. P. O. Box 2022, Jacksonville, Fla.

Very desirable buds on sour orange root. Valencias, Hamlins and Jaffas. Also sour orange seedlings. Prices on request. Nursery at Blanton, Fla. Copothorn Groves, Inc., "Bob Thornton" and "Rox Pollard". P. O. Box 310, Tampa.

CROTALARIA SPECTABILIS, fresh crop, scarified, $15.00 per 100 lbs. F. O. B. Eustis. GRAND ISLAND NURSERIES, EUSTIS, FLA.

THOUSANDS of Rough Lemon Seedings, six to twenty inches high. $1.50 per hundred; $12.50 per thousand; ten thousand or more at $10.00 per thousand. Strong field grown plants. INDIAN ROCK NURSERIES, Largo, Florida.

HARDIN'S SPERRYOLA Lemon, a profitable adapted commercial variety for all sections. Hardy, prolific grower and producer. Limited number choice trees. Hardin Nurseries, Box 63, Lakeland, Fla.

CITRUS NURSERY TREES, standard and new varieties on Cleopatra and Sour. Priced from 30c up. Grand Island Nurseries, Eustis, Fla.

SEED—Rough lemon, sour orange, cleopatra. New crop from type true parent trees. Also thrifty seedlings. DeSoto Nurseries, DeSoto City, Florida.

NEW COMMERCIAL lemon for Florida, the Perrine; proven. All residents need yard trees, keeping Florida money at home. Booking orders for budded stock for Winter delivery. DeSoto Nurseries, DeSoto City, Fla.

CITRUS SEEDLINGS, all root stock varieties. $10.00 per 1000 up. Grand Island Nurseries, Eustis, Fla.

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